SECTION VII.—WEATHER AND DATA FOR THE MONTH.

WEATHER FOR NOVEMBER, 1918.

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PRESSURE AND WINDS.

The distribution of the mean atmospheric pressure over the United States and Canada and the prevailing direction of the winds for November, 1918, are graphically shown on Chart VII, while the means at the several stations, with the departures from the normal, are shown in Tables I and III.

The average barometric pressure for November was slightly above the normal in the Ohio and lower Mississippi Valleys, the Great Plains, and the far Northwest. Elsewhere it was below the seasonal average. The departures were everywhere small. A more detailed discussion of the daily movements of the important cyclones and anticyclones will be found under Forecasts and Warnings.

The general distribution of the barometric pressure favored westerly winds in the northern portion of the country from the Rocky Mountains eastward, northerly in the South Atlantic and east Gulf States, and southerly in the west Gulf and southern Great Plains States. Elsewhere variable winds prevailed.

TEMPERATURE.

The month opened with generally cool weather in most districts, except in the north Pacific States, where temperatures were above the seasonal average. The line of freezing extended as far south as Fort Smith, Ark., and light frost occurred in the east Gulf States on the morning of the 2d. Toward the middle of the first decade much warmer weather overspread the Plains region and moved slowly eastward, reaching the Atlantic States the latter part of the decade. At the beginning of the second decade temperatures still above the normal obtained in most sections of the country, continuing until after the middle of the month, about which time high temperatures for the season occurred to eastward of the Plains States and along the North Pacific coast. Early in the third decade temperatures somewhat below the seasonal average overspread the central and western districts, and moved slowly eastward, over the northern sections, and the month closed with moderately cold weather for the season in practically all parts of the country. The month as a whole averaged more than 6 degrees a day above the normal in the upper Mississippi Valley and parts of the upper Lakes region, and it was warmer than the normal on the north Pacific coast and in most central and eastern States. It was colder than the average in the Rocky Mountains and Plateau districts and in most of the South.

PRECIPITATION.

At the beginning of November generally fair weather prevailed, except that light rain was falling in the northeastern States, and snow was reported at points in the Lake Superior region and the mountainous portion of Virginia. During the next few days fair weather prevailed east of the Rocky Mountains, except for light rain or snow from the Lakes region eastward. At the same time rain set in over the far Northwest and moved slowly southeastward, overspreading most districts to the Mississippi Valley, and thence over the Great Lakes and to the eastward. Heavy falls occurred in portions of California, and locally in the Missouri Valley, the Gulf States, and Lake region. During the first few days of the second decade fair weather prevailed in practically all districts, except for some rain over the North Pacific coast. However, about the middle of the month general rains occurred in nearly all sections of the country, except in the Eastern States, and during the next several days rather substantial rains occurred from the Mississippi Valley eastward. Early in the third decade there was snow in the central Rocky Mountain and Plains regions, with cloudy, unsettled weather to the eastward, and rain prevailed in the far South during the next few days. About the middle of the decade rain or snow occurred locally over many portions of the Pacific Coast and Plateau regions, and toward the latter part of the decade general rains occurred throughout the Southern States and great central valleys, and snow to the northward, the rainfall being heavy in portions of the East Gulf States. At the close of the month the weather was fair in practically all sections of the country, except for light rain in the far South and Southeast, and light snow locally in the Lake region.

For the month as a whole the precipitation was heavy in much of the Gulf coast section, and substantial amounts fell from northern Oklahoma to the lower Missouri Valley, over much of the Mississippi Valley and Lakes region, and in the northern portion of the Pacific Coast States. From the Ohio Valley, Tennessee, and Virginia northeastward the precipitation was light, as was also the case in the central Rocky Mountain district and western portion of the central Plains States, where it was mostly in the form of snow.

SNOWFALL.

Considerable snow fell during November in the Plains region, from Montana and North Dakota to central Texas, and westward to the Sierra Nevada. In the southern Rocky Mountains the fall was unusually heavy, and on account of the cold weather much remained on the ground at the close of the month. From Oklahoma and Kansas northeastward to the Lakes region there was more or less snow during the latter part of the month, the falls being heavy in northern Michigan, and in northern New York and portions of New England there was likewise considerable snow. (See Chart VIII.)

RELATIVE HUMIDITY.

The relative humidity was above the normal throughout the country, except in the lower Lake region, the far Northwest, and locally along the Atlantic, Gulf, and Pacific coasts, where it was below the seasonal average. Over portions of the central Rocky Mountain region and central Missouri Valley the relative humidity was from 15 to nearly 20 per cent above the normal.

GENERAL SUMMARY.

The weather during the month was favorable for farm work, except in most parts of the South, where frequent rains caused some delay. Much late cotton matured

under the influence of the mild weather and the absence of severe frosts, especially in the western cotton area, and the top crop was larger than expected, although a considerable portion of it was damaged by rain. Harvesting of the crop made satisfactory progress.

The month was exceptionally favorable for winter wheat, the crop started well and was in unusually favorable condition to enter the winter. A larger acreage than usual was reported from nearly all the more important grain-producing States. Other winter grains made satisfactory growth during the month. Truck crops progressed favorably, except there was some injury by frost and heavy rains in the western Gulf region.

The month was generally favorable for pastures, and while the cold rains and snows during the latter part of the month were unfavorable for stock from Texas west to Arizona, yet in most sections it was in uniformly good condition. The weather was favorable for citrus fruit and for saving the apple crop in the North Pacific States.

SEVERE LOCAL STORMS.

The following note of a severe storm has been extracted from the official Weather Bureau report:

Pennsylvania.—On November 17, 1918, between 11:30 p. m. and midnight, during the prevalence of a thunderstorm attended by heavy rain, a tornado swept over Riverside, about 2 miles north of Harrisburg. The tornado moved from southwest to northeast and its path was about 500 feet wide and from 1,500 to 2,000 feet long. One dwelling was overturned, another lifted up and dropped back into its cellar, and about 50 other buildings unroofed or otherwise damaged; loss estimated, $100,000. Two persons were injured.

Average accumulated departures for November, 1918.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	° F.	° F.	° F.	Ins.	Ins.	Ins.	0-10.		P. ct.	
New England	41.4	+2.0	− 6.4	2.43	−1.10	− 5.30	6.3	+0.2	75	−1
Middle Atlantic	45.8	+1.6	− 0.9	1.47	−1.40	− 6.90	5.3	−0.1	72	−2
South Atlantic	54.1	0.0	+ 5.5	2.75	−0.10	−13.50	4.1	−0.3	76	0
Florida Peninsula	71.6	+0.6	+ 6.1	1.35	−0.90	−16.90	4.3	+0.1	76	−4
East Gulf	55.4	−0.3	+ 8.8	4.80	+1.30	+ 2.30	4.7	+0.2	76	+1
West Gulf	55.1	−1.3	+ 6.6	4.49	+1.40	− 6.70	5.6	+0.9	74	+1
Ohio Valley and Tennessee	45.5	+0.7	− 1.0	1.78	−1.70	− 4.80	5.7	+0.1	72	−1
Lower Lakes	42.1	+3.0	− 4.5	1.75	−1.20	− 2.60	7.0	−0.3	74	−2
Upper Lakes	39.3	+5.0	− 3.4	2.81	+0.40	− 2.60	7.0	−0.1	80	0
North Dakota	30.0	+5.4	+16.4	1.16	+0.40	− 3.30	5.6	+0.1	82	+3
Upper Mississippi Valley	42.1	+4.3	+ 5.0	2.10	0.00	− 2.00	5.6	+0.1	75	+1
Missouri Valley	41.0	+4.3	+18.9	2.44	+1.20	− 2.60	4.9	0.0	77	+7
Northern slope	31.8	−0.2	+ 8.9	0.52	−0.20	+ 1.10	4.9	−0.2	71	+2
Middle slope	41.8	0.0	+10.9	1.72	+0.80	+ 1.10	4.3	+0.3	72	+9
Southern slope	48.5	−2.5	+11.1	1.44	+0.90	− 5.70	4.7	+0.3	68	+2
Southern Plateau	46.5	−2.4	− 0.8	0.73	+0.20	0.00	3.2	+0.4	54	+6
Middle Plateau	36.4	−3.1	+ 2.5	0.68	−0.20	− 0.70	4.6	+0.3	61	0
Northern Plateau	38.7	+0.1	+17.6	0.67	−0.90	− 1.90	6.2	+0.1	72	+1
North Pacific	46.6	+1.0	+14.1	4.91	−2.00	− 5.70	7.8	+0.2	85	−1
Middle Pacific	51.6	−1.5	+ 4.7	4.05	+0.90	− 3.30	4.6	−0.1	75	0
South Pacific	57.6	+0.5	+23.0	2.39	+1.20	+ 3.50	3.4	−1.0	67	0

WEATHER CONDITIONS OVER THE NORTH ATLANTIC DURING NOVEMBER, 1917.

The data presented are for November, 1917, and comparison and study of the same should be in connection with those appearing in the REVIEW for that month.

Chart IX (XLVI–101) shows the averages of pressure, air temperature, water surface temperature, and the prevailing direction of the wind at 7 a. m., 75th Meridian Time (Greenwich mean noon).

Notes on the location and courses of the more severe storms of the month are included in the following general summary.

PRESSURE.

The distribution of the mean atmospheric pressure for the month differed from the normal in several respects. The Azores or North Atlantic HIGH was considerably greater in intensity than usual, and about 1,000 miles northeast of its usual position. The Icelandic LOW, with its center between Iceland and the Scandinavian Peninsula, was well developed, and there was a second LOW central near latitude 52°, longitude 48°. The following table gives for a number of selected 5-degree squares the average pressure for each of the three decades of the month, as well as the highest and lowest individual readings reported during the month within the respective squares.

Pressure over North Atlantic Ocean during November, 1917, by 5-degree squares.

Position of 5-degree squares.		Decade means.			Extremes.			
					Highest.		Lowest.	
Latitude.	Longitude.	I.	II.	III.*	Pressure.	Date.	Pressure.	Date.
°	°	Inches.	Inches.	Inches.	Inches.	November.	Inches.	November.
60-65 N	20-25 W	29.85	29.86	29.73	30.23	2	29.46	29
60-65 N	0- 5 E	29.62	29.88	29.38	30.30	3	29.00	27
55-60 N	35-40 W	29.87	29.72	29.80	30.16	2	29.42	10
55-60 N	10-15 W	29.77	30.03	29.80	30.30	15	29.30	9
50-55 N	55-60 W	29.88	29.68	29.86	30.42	5	29.30	10
50-55 N	25-30 W	29.97	29.93	30.05	30.10	22	29.61	29
50-55 N	0- 5 W	29.81	30.34	30.03	30.51	18	29.27	9
45-50 N	65-70 W	30.08	29.90	30.02	30.50	4,27	29.50	24
45-50 N	40-45 W	30.00	29.77	29.96	30.32	23	29.49	13
45-50 N	10-15 W	30.03	30.39	30.39	30.53	23	29.84	10
40-45 N	70-75 W	29.98	29.80	29.90	30.30	5	29.59	14
40-45 N	25-30 W	30.19	30.23	30.42	30.55	25	29.68	1
35-40 N	75-80 W	30.31	30.09	30.05	30.62	25	29.46	22
35-40 N	35-10 W	30.20	30.17	30.34	30.52	24	29.95	2
35-40 N	10-15 W	30.24	30.35	30.42	30.53	26	30.15	2
30-35 N	50-55 W	30.07	30.07	30.15	30.25	23	29.90	7
30-35 N	25-30 W	30.24	30.31	30.38	30.50	22	29.80	1
25-30 N	90-95 W	30.28	30.17	30.13	30.40	2	29.95	22
25-30 N	60-65 W	30.06	30.05	30.08	30.28	28	29.98	24
25-30 N	15-20 W	30.24	30.23	30.27	30.41	10	30.08	2
20-25 N	75-80 W	30.00	30.01	30.06	30.25	27	29.90	6
20-25 N	50-55 W	30.00	30.08	30.11	30.20	20,23	29.90	7
15-20 N	35-10 W	30.01	30.08	30.06	30.18	23	29.89	1
10-15 N	80-85 W	29.88	29.90	29.93	29.98	24,27	29.80	7

* The mean values presented in the above table are based on the interpolated daily pressure for each square on the daily synoptic charts of the North Atlantic, compiled by the marine section of the Weather Bureau. The extremes are the highest and lowest actual readings observed within the respective squares.

GALES.

The number of days on which gales occurred was considerably below the normal over the entire ocean, with the exception of a small area in the vicinity of the south coast of Florida, where they were slightly more numerous than usual.

On the 2d and 3d a LOW of moderate intensity surrounded the Azores, although only light to moderate

winds were reported from that locality. On the 3d a HIGH, with a crest of 30.40 inches, extended along the American coast between Hatteras and northern Florida, and vessels in the easterly and southerly quadrants encountered gales of from 50 to 55 miles an hour. On the 4th the crest of the HIGH was near Montreal, where the barometric reading was 30.66 inches. At the same time a LOW of 29.86 inches surrounded Bermuda, and moderate northeasterly gales still prevailed over the same territory as on the previous day.

On the 5th a LOW of 29.86 inches covered a limited area between the Isthmus of Panama and Cuba, and winds of gale force were observed by a few vessels in the eastern part of the Gulf of Mexico, as well as in Cuban waters, although a number of reports were received from vessels in that region that experienced only light to moderate winds. On the 6th an area of low pressure covered the eastern part of the Gulf of St. Lawrence, and moderate southwesterly gales occurred over the Banks of Newfoundland. From the 9th to the 14th this LOW remained nearly stationary, but no heavy winds were reported during that period.

On the 14th a slight depression (I on Chart IX) was central about 150 miles east of Charleston, S. C. Low I drifted slowly northeastward parallel with the coast, and on the 15th the center was about 120 miles south of Hatteras, where moderate winds were the rule. The disturbance continued in its northeasterly course, being central on the 16th near Halifax, N. S., where the barometer reading was 29.56 inches. One vessel a short distance south of St. Johns, N. F., encountered a moderate southeasterly gale, while over the greater part of the territory between the 50th meridian and the North American coast moderate weather prevailed. During the next 24 hours the movement of the LOW was slight, as on the 17th the center was at Sydney, C. B. I., the conditions of wind and weather remaining about the same as on the 16th.

From the 19th to the 28th there was a LOW of varying intensity in the vicinity of the Scandinavian Peninsula and the North Sea. Moderate to strong gales were recorded on a number of days during this period between the 15th meridian and the European coast, although it was impossible to determine the conditions accurately, due to lack of sufficient observations.

On the 22d a LOW (II on Chart IX) covered that part of the American coast between Hatteras and New York, where light to moderate winds prevailed. This disturbance pursued a course similar to that of Low I, and on the 23d the center was a short distance east of New York, wind and weather remaining about the same as on the previous day. By the 24th the center of this depression had reached Halifax, moderate weather still continuing along the North American coast. Low II then curved sharply toward the east, increasing its rate of translation, and on the 25th the center was in the vicinity of St. Johns, N. F. No heavy winds were encountered, but hail was reported off the New Jersey coast, and snow and fog between latitude 40°–45°, longitude 45°–50°. During the 26th and 27th this LOW apparently remained in the same position as on the 25th, increasing somewhat in extent, but it was impossible to plot its center accurately, on account of lack of observations. On the 26th one vessel about 200 miles east of the Virginia coast reported a moderate northwesterly gale, with hail and snow, while hail and snow prevailed off the coast of Nova Scotia also, and fog was observed near latitude 45°, logitude 51°. The conditions on the 27th were about the same as on the day before, with the exception that no fog was reported on that date. On the 29th there was a well-developed LOW of limited extent central near latitude 41°, longitude 60°, and strong northwesterly gales were encountered in the southwesterly quadrants and hail was reported near the center.

AIR TEMPERATURES.

The average monthly temperature of the air was considerably above the normal over the greater part of the ocean, especially north of the 40th parallel, and in the northern part of the Gulf of Mexico, where large positive departures were the rule. South of the 35th parallel the temperatures were nearly normal, while in the southern division of the Gulf of Mexico the departures were very irregular, varying from +4° in the west to −2° in the east. The seasonal fall in temperature was marked in northern waters, as in several 5-degree squares the monthly mean was 3° to 4° below the average for the first decade. The fluctuations from day to day also were marked, and in the square that includes the east coast of Labrador the temperature ranged from 32° on the 28th to 50° on the 7th.

The following table gives the temperature departures at a number of Canadian and United States Weather Bureau stations on the Atlantic and Gulf coasts:

	°F.		°F.
St. Johns, N. F.	+2.8	Norfolk, Va.	−3.4
Sydney, C. B. I.	+0.9	Hatteras, N. C.	−5.3
Halifax, N. S.	−1.7	Charleston, S. C.	−3.7
Eastport, Me.	−4.4	Key West, Fla.	−4.0
Portland, Me.	−3.0	Tampa, Fla.	−2.6
Boston, Mass.	−1.8	Mobile, Ala.	−0.9
Nantucket, Mass.	−5.0	New Orleans, La.	−1.6
Block Island, R. I.	−5.0	Galveston, Tex.	−0.3
New York, N. Y.	−2.8	Corpus Christi, Tex.	+3.0

WATER-SURFACE TEMPERATURE.

The average water surface temperature did not differ as much from the normal as that of the air. Off the banks of Newfoundland and in some portions of the steamer lanes positive departures of from 2° to 4° prevailed, while in the waters adjacent to the American

and European coasts they were irregular, varying from −2° to +2°. In the Gulf of Mexico the water temperatures were from 2° to 3° lower than usual, while in the southeastern division of the ocean they were practically normal.

The seasonal fall in water temperature was not as marked as that of the air, although perceptible in northern waters. The daily fluctuation also was comparatively slight, as the greatest monthly range for any 5-degree square was not over 12°.

HAIL AND SNOW.

Fog was not reported on more than two days in any one 5-degree square, and it was much below the normal over the steamer lanes also, although so few vessel reports were received from the eastern division that it was impossible to give the conditions accurately.

FOG.

Hail and snow occurred on from one to two days over the western portion of the steamer routes, but none was reported from the central and eastern sections.

Winds of 50 mis./hr. (22.4 m./sec.) or over, during November, 1918.

Station.	Date.	Velocity.	Direction.	Station.	Date.	Velocity.	Direction.
Block Island, R. I..	26	59	nw.	North Head, Wash.	2	54	se.
Do	30	54	nw.	Do	8	66	s.
Buffalo, N. Y.	19	50	sw	Do	9	84	se.
Do	24	56	sw.	Do	10	88	se.
Do	25	56	sw.	Do	13	60	s.
Do	28	66	sw.	Do	14	66	se.
Do	29	76	sw.	Do	15	52	s.
Do	30	76	sw.	Do	26	54	nw.
Chicago, Ill.	28	50	sw	Pensacola, Fla.	28	61	sw.
Cleveland, Ohio.	30	52	w.	Pittsburgh, Pa.	28	50	sw.
Dayton, Ohio.	28	51	w.	Point Reyes Light,			
Detroit, Mich.	28	60	sw.	Cal.	3	58	s.
Duluth, Minn.	17	53	nw.	Do	14	58	sw.
Do	18	53	w.	Do	17	73	se.
Eastport, Me.	18	64	e.	Do	18	60	se.
Do	19	67	e.	Do	23	68	nw.
Ellendale, N. Dak..	17	58	nw.	Do	24	61	nw.
Erie, Pa.	28	60	se.	Do	27	56	ne.
Do	29	55	sw.	Providence, R. I.	30	51	nw.
Do	30	60	w.	St. Louis, Mo.	28	52	sw.
Grand Haven, Mich	28	51	w.	Sandusky, Ohio.	28	54	sw.
Louisville, Ky.	28	50	sw.	Sandy Hook, N. J..	18	52	s.
Mount Tamalpais				Tatoosh Island,			
Cal.	3	60	se.	Wash.	9	57	s.
Do	23	52	s.	Do	13	73	s.
Do	25	50	nw.	Do	22	60	e.
Do	27	53	n.	Do	23	62	e.
New York, N. Y..	18	51	w.	Do	26	57	nw.
Do	26	52	nw.	Toledo, Ohio.	28	64	sw.
Do	30	55	nw.				